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ABSTRACT

This paper has reviewed research in "modeling" or observational learning that supports basic elements of social learning theory. The authors point out that past modeling research has not taken into account subjects' self-evaluation and task competence as factors possibly mediating the acquisition and performance of behavior. Social comparison, cognitive consistency, and phenomenological theories were examined in relationship to the outcomes of past modeling research. When modeling research was integrated within these theoretical contexts, contradictions in hypothesized research results were shown. In addition, therapeutic and educational settings were discussed in view of the limitations of past modeling research. Recommendations for future basic and applied research were given. References are included. (Author)

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# A Discussion Of The Theoretical Contradictions Found In Modeling Research and Social Learning Theory When Interpreted Within Phenomenological And Social Comparison Contexts

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## Introduction to Modeling Research

Within social learning theory there is evidence that a significant amount of human learning may be accounted for through the process of imitation or "modeling" behavior. Certain interpretations of social learning theory indicate evidence that modeling is a major and important factor contributing to development. According to Bandura (1962), new responses may be rapidly acquired and existing behavioral repetoires may be considerably changed as a function of observing the behavior and attitudes of models. He calls this type of learning "imitation" in behavior theory and "identification" in most theories of personality.

In providing an explanation of modeling phenomena Mowrer (1950) says, as a model mediates the child's biological and social rewards, the behavioral attributes of the model are paired repeatedly with positive reinforcement and thus acquire secondary reinforcing value. The child can administer positively conditioned reinforcers to himself simply by reproducing as closely as possible the models' positively valenced behavior. One study in particular, by Bandura and Kupers (1964), attempted to determine the manner in which self-reinforcing responses are acquired. Their results indicated that subjects will adopt the particular criteria for self-reinforcement exhibited by a reference model, evaluate their own performance relative to that standard, and then serve as their own reinforcing agents through imitation of the model's behavior.

Most modeling research to date has been concerned with the effects of variation in model characteristics on the observer's

performance. Assumedly, characteristics of the model and the reinforcing consequences of the model's behavior may influence imitative learning and performance through a variety of underlying mechanisms (Bandura, Ross & Ross, 1963; Liebert & Fernandez, 1970). For example, it has been suggested that observers infer from a model's characteristics the degree to which imitation is appropriate or is likely to lead them to successful outcomes (Grusec & Mischel, 1966; Liebert & Allen, 1969). Thus it is understandable why experienced and competent models are more likely to be imitated than are inexperienced and incompetent ones. Rosenbaum and Tucker (1962) and Baron (1970) have pointed out that model competence and attractiveness, as perceived by adult observers, are important determiners of imitative behavior. Likewise, similarity between the model and the observer may also operate by influencing the perceived appropriateness and potential utility of imitating a model's behavior (Maccoby & Wilson, 1957; Rosekrans, 1967).

In addition, modeling research indicates that it is possible for children and adults to learn to evaluate their performances by imitating directly the standards and evaluations that parents and other models apply to themselves. This seems reasonable in view of research evidence that children imitate a model's performance standards for self-reinforcement (Bandura & Whalen, 1966; Mischel & Liebert, 1966; Olfstad, 1967).

In researching the literature, it might be concluded that characteristics of a model and the reinforcing consequences of a model's performance represent the main body of evidence on which

social learning theory rests. Bandura (1969) has looked beyond modeling paradigms to account for the complexity of human behavior. However, he continues to view social reinforcement as the most important variable in accounting for behavior change. References to attitudes, self-concept, self-evaluation, and other personality factors, imply that these can be significantly shaped and altered through the consequence of social reinforcement.

## Factors Mediating Observational Learning

Certain personality characteristics and situational factors may predispose individuals to be influenced more, and in a wider variety of ways, by particular modeling stimuli. For example, dependent children may show more imitative behavior than independent children (Jakubczak & Walters, 1959; D. Ross, 1966). Imitation has also been enhanced by a history of failure, especially punishment for independence (Gelfand, 1962), and by social deprivation experience (Rosenblith, 1961). According to Bandura and Walters (1963), persons who lack self-esteem, are incompetent, have reinforcement histories of matching responses, or are dependent, are especially prone to imitate "successful" models. This generalization has received some support in the research literature (Gelfand, 1962).

Bandura and Walters (1963) cite much evidence from studies on behavior modification supporting their contention that behavior can be changed to more positive behavior through imitation. It is of interest to note two points not elucidated in this earlier work: First, the authors do not discuss how observers

perceive the behavior of models; only whether learned behavior is overtly performed or can be recalled. Secondly, they do not discuss "self" constructs as factors mediating observational learning. This seems to be a weakness of much research in the area of social learning theory. Studies usually demonstrate overt imitation of a model's behavior, but neglect considering the observer's perception of the situation and whether changes in self-concept and/or self-evaluation are occurring. However, most seemingly imply that alterations in self-concept are in fact taking place.

Being essentially a learning theorists' position, Bandura and Walters' approach to the study of personality, like other S-R theorists', eschews states, traits, stages of development, and innate characteristics of the individual organism. Their theoretical and research interests have clearly focused on demonstrating how those behaviors which we tend to call "personality-related" are acquired and maintained. While in general agreement with other learning theorists that operant and classical conditioning play important roles in enhancing and maintaining social behavior, they argue that these paradigms are not sufficient in explaining the acquisition of more complex forms of behavior. They suggest that observational learning plays a key role in the acquisition of more complex forms of human thought and action. They do not, however, view facets of the "self-concept" as important factors mediating observational learning and performance.

In his more recent work Bandura (1969) does attempt to clear up his own position on such constructs as "self-attitude," "self-esteem," and "self-concept." After a brief review of literature

in this area, he describes how these constructs are conceptualized within social learning theory.

> ". . .those who have been exposed to models setting low standards tend to be highly self-rewarding and self-approving for comparatively mediocre performances. By contrast, persons who have observed models adhere to stringent performance demands display considerable self-denial and self-dissatisfaction for objectively identical accomplishments. These findings illustrate how self-esteem, self-concept, and related self-evaluative processes can be conceptualized within a social learning framework. From this perspective, a negative self-concept is defined in terms of a high frequency of negative self-reinforcement and conversely, a favorable self-concept is reflected in a relatively high incidence of positive self-reinforcement (pp. 33-34)."

Bandura has defined self constructs within the framework of social learning theory. However, he apparently has still failed to consider how particular variations in self constructs interact with variables of known importance in determining observational learning and performance. He provides much research evidence indicating that self-attitude can be improved by gradually shaping the behavior of the individual with social reinforcement. It is interesting to note that modeling situations have been infrequently used to bring about these "internal" changes. Turning to the literature, an example provided by Herbert, Gelfand and Hartman (1969) may serve to illustrate the complex nature of experiments in imitation learning, and their theoretical interpretations.

Herbert, et al. (1969) investigated the influence of self-rated esteem and exposure to an adult model on children's learning of self-critical behavior. Half the Ss first observed a same

sex model playing a bowling game on which scores were experimentally controlled. Following low scores, the model gave up rewards and made self-critical remarks. While Ss imitated the model's performance standards for forgoing reinforcement, few of them imitated self-critical comments. Control Ss not exposed to a model neither gave up tokens nor made any comments while playing the game. Results also indicated that neither the game nor the modeling systematically affected the Ss' perception of the adequacy of their performance, as measured by self-esteem ratings.

The authors concluded that apparently self-critical behavior can be learned through imitation of models and self denial of rewards is relatively independent of other types of self evaluations. In other words, the authors felt that by imitating the performance standards of the adult model, Ss were exhibiting self-critical behavior even though it was not verbalized. One might assume, however, depending on theoretical frame of reference, that the Ss imitated the adults' behavior and performance standards, but did not display any self-critical behavior. This interpretation might, for example, follow from social comparison theory if Ss' self-esteem was displaced upward after observing models with undesirable characteristics, i.e., incompetence and poor performance. As predicted from social learning theory, children do imitate behavior even when behavior results in a loss of material rewards; however, this change in overt behavior may not be accompanied by changes in other aspects of the "self."

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In view of the apparent failure of social learning theory to deal more extensively with observer characteristics and the role of the self-concept as important factors mediating imitation learning, one might look elsewhere for alternative predictions and explanations of an observer's behavior in the presence of modeling stimuli. It can be asked, for example, what effect a model performance and performance consequences has on the observer's behavior, under conditions where the observer has previous self-evaluation in relationship to the task? What are the effects of a model's behavior on the observer, when modeling stimuli are incongruent with the observer's self-attitude?

## Theories Employing Self Constructs and Their Relationship To Modeling Research

In the area of interpersonal relationships in social psychology and within phenomenological theories of personality, there exists a broad theoretical and factual base for explaining the acquisition of behavior in a social context. On this side of the theoretical "looking glass," observer characteristics and individual self-concepts play an important role in determining individual behavior. There would seem to be a natural tendency for social learning theorists to explore the role of the self-concept as a factor mediating observational learning since it is often assumed to develop out of identification with others.

Festinger (1954) said that inherent in the developmental process is the tendency to evaluate the self in comparison to others. He points out that people have a constant need to

evaluate their abilities and test the validity of their opinions. Since there are few uniform yardsticks to aid in such evaluations, the person will compare himself with others in order to reach conclusions about himself. Festinger's theory of social comparison is based on the assumption that a correct appraisal of one's opinions and abilities in relation to those of others is presumed to derive from a more basic need for a clearly defined self-concept (Ziller, 1964).

According to social comparison theory, as a result of other's characteristics appearing more desirable or less desirable than his own, a person's generalized self-estimate is displaced downward or upward respectively. The presence of someone with highly desirable characteristics appears to produce a generalized decrease in level of self-esteem. Exposure to another perceived as socially undesirable produces the opposite effect. Thus casual exposure to another person is sufficient to produce a marked deviation on a person's momentary conception of self (Morse & Gergen, 1970).

In theories employing self constructs to explain behavior, the need to maintain cognitive consistency or balance plays an important role. Many theorists have used different terms for essentially the same concept. Heider (1946, 1958) uses the phrase "cognitive balance," Festinger (1957) expresses it as "cognitive consonance," Osgood, Suci, and Tannenbaum (1957) state it as "congruence," and Lecky (1945) employs the term "self consistency." The essential idea underlying these various terms to describe cognitive-affective states, is that the individual

tends to perceive the various aspects of his environment in such a way that the behavioral implications of his perceptions are not in contradiction. According to Festinger's (1957) dissonance theory, when an individual maintains ideas that are psychologically dissonant or inconsistent he experiences tension or discomfort. Dissonance is a tension-producing and basically aversive state, therefore, people are motivated to avoid or remove it. Research findings on self-consistency and on dissonance reduction generally support the view that people reduce inconsistencies between incompatible cognitions (e.g., Abelson & Rosenberg, 1958: Glass, 1968). The relationships between strivings for cognitive consistency and behavior are seemingly quite complex (Festinger, 1964).

There has been some research indicating that people will organize their attitudes and behaviors so as to maintain consistent self-images (Deutsch & Soloman, 1959; Aronson & Carlsmith, 1962; Gerard, Blevans, & Malcolm, 1964). Most of these studies deal with interpersonal evaluations which according to Heider (1958) are the emplicit or explicit expressions of positive or negative value accorded by one person, to either the specific actions of the general characteristics of another person. It seems reasonable to imply from this definition that research in observational and imitation learning does not preclude interpersonal relationships. If modeling can be viewed as occurring within this context, then the relationship between aspects of the self and modeling stimuli has implications for future research.

Within phenomenological theories of personality self constructs play vital roles in integrating experiences with the

environment. The self system is viewed as a consistent organized whole, which implies that all aspects of the self must be essentially in agreement with one another. In Roger's (1950) system, experiences which are consistent with the self and its conditions of worth are valued positively, are allowed to enter consciousness, and are perceived accurately. Experiences which conflict with the self and its conditions of worth are valued negatively, kept from entering awareness, and from being accurately perceived. For Rogers, then, "threat" exists when the individual perceives that there is an incongruity between some experience and his self concept.

In Roger's theory, the self-concept develops as a result of direct experience with the environment and may also involve incorporating the perceptions of others. The experienced self in turn influences both perception and behavior. Support for Roger's contentions about the self system, its complexity, and its development can be found in the research literature. For example, Ziller, Smith and Thompson (1970), found the complexity of the self-concept to be associated with a self report of identification with others, a topological measure of social interest, perception of persons older than the self as more similar to the self, and with greater popularity. They conclude that the complexity of the self-concept is associated with acceptance of and by a wide variety of others. In addition, a multi-faceted self-concept is assumed to maximize the probability of matching an aspect of self and other leading to the perception of similarity between self and others, and acceptance between self and others.

The authors proposed the hypothesis that the individual with the more complex self theory concerning self social relations is less likely to be seriously disturbed by new experiences which momentarily appear to be incongruent with the system. In terms of interpersonal perception, the complex person has a higher probability of matching some facet of the self with a facet of another person, since there are a larger number of possible matches. These aspects of self theory appear very similar to Lewin's (1935) concepts of self differentiation and organization.

According to Wylie (1961), it is expected that a person will try to maintain a favorable self-attitude. On the other hand, an individual strives to maintain his basic self-concept when interacting with the environment and will resist information that is discrepant from his views about himself. This position seems reasonable in view of Festinger's (1957) theory of cognitive dissonance. However, Wylie appears to be stating two different functions of the self-concept, which under certain conditions may be contradictory. What if an individual has a basic self-concept that is not favorable, and thus low self-esteem? Wylie indicates that the individual will resist discrepant information, but in doing so, the individual will be maintaining an unfavorable self-concept. The question then arises, will the individual accept the discrepant information and change his views in order to form a more favorable self-concept? One might easily ask the same question within observational learning contexts. Will a S that has measured low self-esteem and competence relating to some task, imitate the modeling cues of a successful or an unsuccessful model performing the same task?

Where the self-concept has been characterized as integrated and multi-faceted, the high self-esteem person has been conceptualized as liking or valuing himself, as well as seeing himself as competent in dealing with the world he perceives (e.g., Cohen, 1959; Combs & Snygg, 1959; Rogers, 1950). The low self-esteem person is seen as disliking and devaluing himself, and in general perceiving himself as not competent to deal effectively with his environment. According to Silverman (1964), low self-esteem persons can only assimilate information relating to themselves which is consistent with their general self-concept. Assumedly, this information would include modeling stimuli.

Given assumptions forthcoming from phenomenological approaches to personality and behavior, it becomes important to ask several questions about the self system in relationship to observational learning. What determines the kinds of information in various environmental situations to which the individual attends? What determines the types of information about the self to which the individual attends? Is there an interaction between aspects of the self-concept and variables of known importance in determining the acquisition and performance of behavior through modeling?

Aronson and Carlsmith (1962) found that Ss that had a low opinion of their ability in a certain area tended to act consistently with this image. When Ss (in a low self-esteem condition) did well on a task and were given an opportunity to repeat the task, they changed their successful responses indicating that they did not like to appear to be successful. Deutsch & Solomon

(1959) found similar results. In Gelfand's (1962) study, low self-esteem Ss would not try to improve their performance by use of self-reinforcement. Gelfand also found that, regardless of initial level of self-esteem, Ss that experienced failure became more susceptible to subsequent manipulations (verbal conditioning) than those who experienced success. In addition, Ss exposed to experiences inconsistent with their usual self-evaluations (high-esteem Ss experienced failure and low-esteem Ss experienced success) were more influenced (on the verbal conditioning task) than Ss whose experiences were congruent with their initial self-esteem ratings. Rich data are offered here bearing on the interactive nature of self-esteem and environmental experiences.

## Problems and Limitations of Modeling Research

As mentioned previously, research in social learning theory has demonstrated its fruitfulness in identifying important variables determining the acquisition and performance of behavior through modeling. However, current research efforts have not answered questions concerning the interaction between aspects of the self-concept and modeling stimuli, and their effects on behavior change. Current literature in social learning theory seems to indicate that modeling predictions are confirmed when Ss have no particular concept of their competence on the task involved; and have no self reference for the particular modeling stimuli observed. Proposed in this paper is that certain behaviors occurring in social learning contexts may not fit the

predictions derived from modeling research, and may be more adequately predicted and explained within social comparison and phenomenological contexts.

In many of the original studies quoted in support of modeling and social learning theory there have been serious limitations in terms of the subjects used, and tasks selected for the subjects to perform. In classical paradigms for studying the effects of models' behavior on that of observers, tasks have varied from very realistic performances such as subjects observing a model interact with a Bobo doll (Bandura, 1965); to "listening" to models demonstrating either competent or incompetent responding via tape recordings on a paired associate nonsense syllable task (Kanfer & Deurfeldt, 1967).

Modeling research has limited most of its studies to children. It might be argued that this is a population in the process of developing a mature, or as Lewin (1935) puts it, a "differentiated" self-concept, and can therefore be more influenced by the behavioral consequences of a successful, competent, and positively reinforced model. Indeed, this seems well demonstrated in most social learning experiments to date. However, the results of numerous studies in observational learning and the modeling paradigm may not be generalizable to adults who are conceived of in other contexts, as having more well developed and stable self-concepts. This seems quite reasonable since social learning implies change and modification, and children developmentally are in the period of greatest change.

Apparently adults do not behave (imitate) in the same manner as children. In referring to studies of imitative aggression, Bandura states, "findings from adult studies are less clear-cut than those obtained with children (Bandura & Walters, 1963)." Perhaps studies in modeling and imitation learning have only measured overt behavioral performances without any accompanying alteration in self-concept. Again, this seems reasonable since most young children have not reached an age in development where they have self-attitudes and "felt" competencies concerning the simple tasks involved in most modeling studies. Support for the view presented here is found in Baldwin (1968) who suggests that social learning theory is really too simple. Its identification of important variables related to determining the acquisition and performance of behavior through observational learning may be correct. However, it seems as if more complexity in research interests and design will be required to account for the variety of developmental phenomena related to learning in children.

## Implications for Future Research

It may be of interest in the future to see how children who have previous task competence, and thus high self-evaluation in relationship to the task, respond to competent and incompetent models in reward, no reward conditions; and how children who have previous task incompetence, and thus low self-evaluation in relationship to the task, respond to competent and incompetent models in reward, no reward conditions. In other words, future

research might consider the effects of various modeling conditions and behavioral consequences on an observer's behavior when the observer has previously acquired self-evaluation and competence in relationship to the task.

As mentioned elsewhere, changes in self-concept may not be involved where behavior is changed through observational learning and performance of simple behaviors. Bandura and Kupers (1964), seemingly imply that changes in self-concept can be effected through observational learning and modeling when they project their data as being useful in psycho-therapeutic situations and in modifying standards of self-reinforcement. They suggest for example, that understanding the process of self-reinforcement can be of value in psychotherapy, especially for clients who display a great deal of self-generated, aversive stimulation and self-imposed denial as positive reinforcers stemming from their excessively high standards for self-[illegible] reinforcement.

From other theoretical contexts it might be speculated that Ss with measured low self-esteem relating to their competence on some task might accord more value to modeling stimuli offered by an incompetent than a competent model performing the same task, and ostensibly imitate more of the total behaviors of the incompetent model. This outcome would seem quite predictable from the theoretical formulations and data found within social comparison, cognitive consistency, and phenomenological contexts.

## Reservations in the Application of Social Learning Theory

Therapy and counseling appear to be two professional areas where social learning theorists and modeling researchers indicate their observations may be of value. These applications, however, may be unwarranted owing to the limitations of past research. The majority of research in support of observational learning to date, has been done with children. To generalize the results obtained from this population to older subjects, i.e., "adults," requires reservations. Most individuals in counseling and therapeutic settings are more likely to be adults whose reactions to models (i.e., therapists, peers, older adults) varying in competency and modes of reinforcement, may be markedly different from those behavior changes observed in modeling studies with children. This reservation, when integrated with research literature, may require that those viewing modeling phenomena as important adjuncts to therapy, expand future studies to include adult populations.

For example, Rosenthal (1955) found in spite of the usual precautions taken by therapists to avoid imposing their values on clients, clients judged as showing the greatest improvement changed their values concerning sex, aggression, and authority in the direction of the values of their therapists. This result tends to support the use of modeling as a means of inducing positive behavior change. However, assuming that therapists functioned as "competent" models for all clients in Rosenthal's study, one might ask why clients going unimproved became less like their therapists?

be considered aspects of one's self-concept, and that therapists in counseling settings can be seen as models, one might ask whether the changes observed were predictable from social learning theory alone? Asked another way, what is the interaction between therapist competence, client competence, and overt changes in behavior?

Some studies have been done in the past concerning changes in self-concept, usually comparing counseled Ss to non-counseled Ss (Caplan, 1957; Rogers & Dymond, 1954). Most of these indicate that changes in self-concept are significantly related to successful therapy. Wylie (1961), for example, states that "if counseling or therapy is judged by external criteria to be successful it will bring about various changes in the self-concept, such as an increased agreement between self-estimates and objective estimates of one's own limitations as well as assets." Similarly, O'Dea and Zeran (1953) concluded that their findings with the MMPI, "pointed out and supported the claim that the criteria of success of counseling should in part be concerned with the degree and direction of change in the self-concept and its concomitant effects upon behavior." Thus, therapeutic change agents are usually concerned with not only altering a client's evaluations of different behaviors, but in modifying the client's self-attitudes as well.

According to Bandura (1969), "unfavorable self-attitudes stem from behavioral deficits and are repeatedly reinforced through failure experiences occasioned by the person's inability to meet realistic cultural expectations." The authors do not

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According to Bandura (1969), "unfavorable self-attitudes stem from behavioral deficits and are repeatedly reinforced through failure experiences occasioned by the person's inability to meet realistic cultural expectations." The authors do not

dispute that unfavorable self-attitudes are the result of behavioral deficits relating to one's reinforcement history; nor that significant attitude changes can be induced by providing Ss with successful task experiences. There is more than ample research to support this view (e.g., Breer & Locke, 1965). However, owing to populations studied and the relative simplicity and "novelty" of tasks used in past modeling research, the use of modeling as an adjunct to successful therapy is suspect. Results of these studies may not be generalizable to adults who are conceived within other theoretical contexts as having more complex and stable self-concepts. The use of symbolic modeling as a therapeutic technique significantly related to reducing phobic responses has been shown (e.g., Bandura, Grusec, & Menlove, 1967). However, phobic reactions hardly represent the wide range of competencies and self-evaluations maintained by adults.

In addition, Bandura (1969) suggests that task competencies, self-attitudes, and standards of reinforcement can become internalized and serve a self-regulatory function for behavior. Again, the authors do not dispute this contention. However, the use of competent models whose behaviors generate reinforcing consequences, may not effect significant changes in client's self-attitudes, even though overt changes in behavior are observed.

These same considerations need to be made in educational settings where operant psychologists suggest the use of modeling as one means of enhancing instruction (Ackerman, 1972). If the learner has previously developed opinions and behaviors contrary to those being presented by the teacher as model, reinforcing

consequences of the teacher's performances may not be enough to effect lasting changes in student behavior.

One of the main problems with which operant psychologists have had to content is the failure of performances learned in one context, to generalize to others. This may be due to subjects acquiring and demonstrating overt behaviors that are environmentally specific owing to the lack of any alteration in self-attitudes concerning performance taking place. Once removed from the specific consequences found in the learning environment, the subject demonstrates performances consistent with previously acquired competencies and self-attitudes. This view seems consistent with Bandura's (1969) contention that ". . .development of self-regulatory functions is essential if induced behavioral changes are to transfer and to endure in any significant degree." Such internalization of learned behaviors and performance standards may not be forthcoming from modeling situations where subjects maintain previously acquired competencies, and have already internalized self-attitudes concerning model behaviors observed.

To assume that modeling effects in educational settings are ever present, does not seem justifiable. When viewed against the limitations of modeling research cited here, children may not be inevitably influenced by competent models, nor internalize observed model behaviors. This assumption in particular, seems taken for granted by many teachers and educational psychologists alike. Here too, much more research is needed to determine the effects of teacher demonstrated performances on the behavior of children.

To speculate, perhaps white middle-class teachers acting as models for black disadvantaged students demonstrate competent performances quite dissonant with those previously acquired by the students. Like clients in Rosenthal's (1965) study who failed to improve, students with academic incompetence may not improve their performances as a result of observing more competent teachers. When groups of students, demonstrating a wide range of competencies and self-attitudes in relationship to academic tasks observe a competent teacher, the teacher as model, may impede as well as facilitate learning. Applied research in educational settings is needed to determine how student competence, teacher competence, and performance consequences interact in bringing about behavior change through modeling.

## Summary

This paper has reviewed research in "modeling" or observational learning that supports basic elements of social learning theory. The authors point out that past modeling research has not taken into account subjects' self-evaluation and task competence as factors possibly mediating the acquisition and performance of behavior.

Social comparison, cognitive consistency, and phenomenological theories were examined in relationship to the outcomes of past modeling research. When modeling research was integrated within these theoretical contexts, contradictions in hypothesized research results were shown. In addition, therapeutic and educational settings were discussed in view of the limitations of past modeling research. Recommendations for future basic and applied research were given.

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